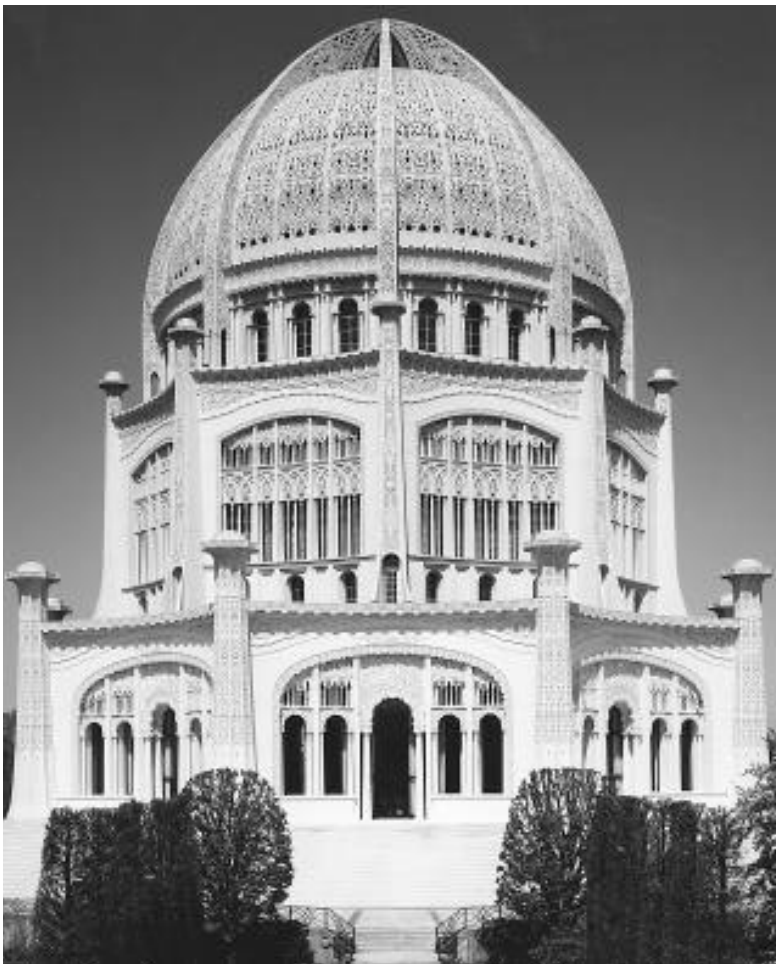

Baha'i House of Worship. Photo by Bill Lemke.

projects and remains a marvelous example of his rare and original detailing technology.

Development of Artisans

Over a decade of investigation, refinement and execution by expert practitioners has yielded the procedures necessary to conserve this unprecedented historic fabric. These practices combine skills from several disciplines. *In situ* restoration, a delicate and exacting process, requires sculptural finesse.

Wholesale replacement, a heavy industrial art, involves replicating, casting, and installing exact reproductions. Access to the facade for monitoring and cleaning requires steeple-jack prowess.

The owner is ready to institutionalize the capacity to perpetuate this care. Men and women recruited and trained in these skills will constitute a very specialized work force. As the conservation ethic and sciences become a routine aspect of the building's maintenance, preservation of the structure is assured.

In the milieu of architectural traditions, artistic exposed aggregate concrete is a sub-specialty with a very recent history. Within this class, the House of Worship is peerless. It is curious, yet fitting, that the temple itself should foster and house the resources to complete its own unique mission.

John Richardson is a heritage mason and stone sculptor with the Baha'i House of Worship Conservation Group, Wilmette, Illinois.

Larry E. Stearns

Sheet Metal Craftsmanship – Pass It On

Sheet metal roofing is the most challenging discipline of the sheet metal trades. Heights, weather, and an infinite variety of architectural conditions quickly weed out the faint of heart. For those remaining, the rewards are substantial. Certainly the money is good, but more important for me is the opportunity to work on monumental buildings and see my work in place, knowing it will last long beyond my lifetime.

Good sheet metal craftsmanship requires seven basic tools: hammer, measuring tape, scratch awl, dividers, straight edge, snips, and hand seamers. Each of these can be expanded and added to as much as budget or a penchant for gadgets allows. And, each one can be improvised in a pinch. In addition to the tools, a copy of *Copper and Common Sense*, published by Revere Copper, is indispensable. Although somewhat limited and generic, the drawings and photographs demonstrate all the basic roof details and layout. Additionally, there are excellent reference materials and tables outlining mechanical properties and specifications. Missing is any description of how to form and join the materials. Some text books introduce common fabrication techniques, but there is no substitute for hands-on training.

The International Preservation Trades Workshop sponsored by the National Park Service is an excellent place to begin the hands-on experience. Those interested in sheet metal need this type of venue to learn traditional skills, that for years, have been considered "trade secrets." Europeans are willing to invest years in training apprentice sheet metal roofers and yet here, in the United States, an individual is considered a master roofer with a mere 90 hours of sheet metal; 50

Larry Stearns works on site soldering columns for a historic replication of a tower belvedere. The original structure was struck by lightening and destroyed by the ensuing fire. Photo courtesy the author.

hours shingle, slate, and tile; and 4,000 hours of built up and single-ply experience!

Often I have observed mechanics taking more time to do a job wrong than it would take to do it correctly. Rife in the industry is an attitude of "that's good enough" or "just get it done." The missing ingredient is craftsmanship. For me this term carries all the important attributes of quality work—attention to detail, clean properly installed materials, and a positive work ethic.

A major portion of what I've learned is from watching experienced roofers perform their trade. In my early twenties, I had the good fortune to meet a generous man who had trained in the French roofers guild. He taught me to solder with a gas iron and, in turn, I have taught scores of people the technique. Holding back information and "trade secrets" is against our collective best interest. My experience has been—the more I share, the more I learn.

The preservation field needs sheet metal craftsmen. Snap-on metal roofing systems are appropriate on new commercial buildings, but historic structures require someone willing to use dividers to scribe a flashing for a good fit against a wall that has twisted or settled over time. Custom flashings, often fabricated on the spot, are the rule in restoration work. A reverence for the "old timers" and a desire to match or exceed their craftsmanship is requisite.

"They don't build them like they used to." Fortunately for future generations we are learning from the mistakes of the legendary "they." A near-total disregard for the expansion and contraction of metals, the use of iron fasteners in non-ferrous materials, poor seam design and layout, underbuilt substrates, and bad detailing at the interface between metal and stone, masonry or wood are all typical of the problems encountered on restoration projects. There is as much to be learned from poorly installed sheet metal as there is from a masterpiece. Today's professionals have the failures of the past to point them in the right direction.

Learn mechanical skills, be precise in measuring and layout, and understand the properties of the sheet metal you are using. Read anything you can find relevant to the trade and be a keen observer of the work in place around you. Work with the architect and general contractor to produce the best possible installation. Above all, share the knowledge.

Larry E. Stearns, coppersmith, has 20 years in the historic restoration field and works from his shop, Vulcan Supply Corp., in Westford, Vermont.

Printed on recycled paper

CRM

U.S. Department of the Interior
National Park Service
Cultural Resources
1849 C Street, NW (2251)
Washington, DC 20240

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

FIRST CLASS MAIL
Postage & Fees Paid
U. S. Department of the Interior
G-83

VOLUME 20 • NO. 12
Cultural Resources
Washington, DC